AMENDMENTS TO THE CLAIMS

The following listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1.　　(Currently Amended) A method for controlling a melt temperature of a crystal-growing apparatus comprising ~~the steps of~~:

determining a crystal diameter of a crystal being grown by the crystal-growing apparatus;

comparing the determined crystal diameter with a predetermined crystal diameter value stored in a memory to determine a discrepancy value;

correlating the discrepancy value with the following parameters: a direction that the melt temperature must be adjusted and an amount the melt temperature needs to be adjusted;

transmitting the parameters to a pulse generator for using the parameters to generate pulses having a polarity which indicates whether the melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and

transmitting the generated pulses to at least one input terminal of a temperature controller for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses.

Claim 2.　　(Original) The method according to Claim 1, wherein the method controls the melt temperature independently of the melt temperature as determined by a bottom heater of the crystal-growing apparatus.

Claim 3.   (Original) The method according to Claim 1, further comprising the steps of:

determining a melt level of the crystal-growing apparatus; and

using the determined melt level to determine the crystal diameter of the crystal being grown by the crystal-growing apparatus.

Claim 4.   (Original) The method according to Claim 1, further comprising the steps of:

receiving a temperature adjustment signal from a bottom heater thermocouple of the crystal-growing apparatus which indicates the melt temperature; and

determining whether to increase, decrease or keep constant the melt temperature based on the melt temperature as indicated by the temperature adjustment signal.

Claim 5.   (Original) The method according to Claim 1, further comprising the step of manually increasing/decreasing the melt temperature.

Claim 6.   (Original) The method according to Claim 1, wherein the step of correlating the discrepancy value includes the step of accessing a data structure stored in a memory.

Claim 7.   (Withdrawn) A system for controlling a melt temperature of a crystal-growing apparatus, said system comprising:

means for determining a crystal diameter of a crystal being grown by the crystal-growing apparatus;

means for comparing the determined crystal diameter with a predetermined crystal diameter to determine a discrepancy value;

means for correlating the discrepancy value with the following parameters: a direction that the melt temperature must be adjusted and an amount the melt temperature needs to be adjusted;

means for transmitting the parameters to a pulse generator for using the parameters to generate pulses having a polarity which indicates whether the melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and

means for transmitting the generated pulses to at least one input terminal of a temperature controller for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses.

Claim 8.   (Withdrawn) The system according to Claim 7, wherein the apparatus controls the melt temperature independently of the melt temperature as determined by a bottom heater of the crystal-growing apparatus.

Claim 9.   (Withdrawn) The system according to Claim 7, further comprising means for determining a melt level of the crystal-growing apparatus for use by the means for determining the crystal diameter of the crystal being grown by the crystal-growing apparatus.

Claim 10.   (Withdrawn) The system according to Claim 7, further

comprising:

means for receiving a temperature adjustment signal from a bottom heater

thermocouple of the crystal-growing apparatus which indicates the melt temperature; and

means for determining whether to increase, decrease or keep constant the melt

temperature based on the melt temperature as indicated by the temperature adjustment signal.

Claim 11.   (Withdrawn) The system according to Claim 7, further comprising

means for manually increasing/decreasing the melt temperature.

Claim 12.   (Withdrawn) The system according to Claim 7, wherein the means

for correlating the discrepancy value includes means for accessing a data structure stored in a

memory.

Claim 13,   (Currently Amended) A process control system for controlling a

melt temperature of a crystal-growing apparatus, said process control system comprising:

circuitry for determining a crystal diameter of a crystal being grown by the

crystal-growing apparatus, for comparing the determined crystal diameter with a predetermined

crystal diameter value stored in a memory to determine a discrepancy value, and for correlating

the discrepancy value with the following parameters: a direction that the melt temperature must

be adjusted and an amount the melt temperature needs to be adjusted;

a pulse generator for receiving the parameters and for generating pulses having a polarity which indicates whether the melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and

a temperature controller having at least one input terminal for receiving the generated pulses and for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses.

Claim 14.   (Original) The process control system according to Claim 13, wherein the process control system controls the melt temperature independently of the melt temperature as determined by a bottom heater of the crystal-growing apparatus.

Claim 15.   (Original) The process control system according to Claim 13, wherein the circuitry further determines a melt level of the crystal-growing apparatus for use in determining the crystal diameter of the crystal being grown by the crystal-growing apparatus.

Claim 16.   (Original) The process control system according to Claim 13, wherein the temperature controller further comprises:

an input terminal for receiving a temperature adjustment signal from a bottom heater thermocouple of the crystal-growing apparatus which indicates the melt temperature; and

circuitry for determining whether to increase, decrease or keep constant the melt temperature based on the melt temperature as indicated by the temperature adjustment signal.

Claim 17 (Original) The process control system according to Claim 13, wherein the temperature controller further comprises at least one manually-operational switch for manually increasing/decreasing the melt temperature.

Claim 18. (Original) The process control system according to Claim 13, wherein the circuitry further accesses a data structure stored in a memory for correlating the discrepancy value.

Claim 19. (Original) A process control system for controlling a melt temperature of a crystal-growing apparatus, said process control system comprising:

a pulse generator for generating pulses having a polarity which indicates whether the melt temperature is to be increased or decreased and also having a magnitude which indicates the amount of increase or decrease; and

a temperature controller having at least one input terminal for receiving the generated pulses and for increasing or decreasing the melt temperature of the crystal-growing apparatus according to the polarity and magnitude of the pulses.

Claim 20. (Original) The process control system according to Claim 19, wherein the process control system controls the melt temperature independently of the melt temperature as determined by a bottom heater of the crystal-growing apparatus.